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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,807	08/28/2003	Donald G. McMullin	1875.4300000	5999

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EXAMINER	
HAROON, ADEEL	

ART UNIT	PAPER NUMBER
2618	

DATE MAILED: 07/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/649,807	MCMULLIN ET AL.	
	Examiner	Art Unit	
	Adeel Haroon	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 26 May 2006.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-19 and 21-33 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-19 and 21-33 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to Amendment filed on date: 5/26/06. Claims 1-19 and 21-33 are still pending.

Response to Arguments

2. Applicant's arguments with respect to claims 1-19 and 21-33 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-12, 14-19, 21, 22, 25, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cowley (U.S. 6,954,625) in view of Khorram (U.S. 6,970,689).

With respect to claim 1, Cowley discloses a receiver in figure 1 having a first mixer, element number 5; a second mixer, element number 11; and a bandpass filter, element number 10, coupled between the first and second mixer with the first mixer responsive to a first local oscillator signal, element numbers 8 and 9, that is coupled to said first mixer and the second mixer responsive to a second local oscillator signal, element numbers 13 and 14, a method of compensating for a passband variations of the bandpass filter (Column 2, lines 40-55). Cowley discloses disabling an RF input signal of said first mixer and injecting the first local oscillator signal into an input port of the filter (Column 4, lines 21-28). Cowley also discloses determining an actual passband of the bandpass filter responsive to the first local oscillator signal (Column 4, lines 28-40). Cowley further discloses enabling the RF input signal and mixing an RF input signal having plurality of channels with said first local oscillator signal after said step of determining to generate a first IF signal, including said step of adjusting a frequency of said first local oscillator signal based upon a selected channel of said plurality of channels and based upon said actual passband of said bandpass filter (Column 2, lines 40-55). Even though Cowley disables the RF input signal in calibration mode, a reference signal is still inputted to the mixer. However, Khorram discloses a calibration method of a receiver (Column 3, lines 44-46) thus making it analogous art since it is in the same field of endeavor. Khorram teaches in figure 17 disabling inputs to the mixer during calibration mode in step 1708 with only local oscillator signal being injected into the mixer in step 1706 and enabling the input signal to the mixer after determining the optimum state in step 1714 (Column 13, lines 30-47). Therefore, it

would be obvious to one of ordinary skill in the art at the time of the applicant's invention to use Khorram's disabling of input signals to the mixer technique in Cowley's method in order to minimize local oscillator feedthrough while calibrating other parts of the system (abstract).

With respect to claim 2, Cowley discloses sweeping said frequency said first local oscillator signal and measuring an output of said bandpass filter responsive said sweeping step, to determine said actual passband of said bandpass filter (Column 5, lines 40-55).

With respect to claim 3, Cowley discloses setting a frequency of said first local oscillator signal so said selected channel in said first IF signal falls within said actual passband of said bandpass filter (Column 5, lines 40-55).

With respect to claim 4, Cowley discloses setting said frequency of said first local oscillator signal so as to compensate for variation of said actual passband of said bandpass filter (Column 5, lines 40-55).

With respect to claim 5, Cowley does not expressly disclose that the passband variations are caused by temperature variations. However, it is well known in the art that temperature variations cause an adverse affect on electrical components such as bandpass filters. Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to use the Cowley's method for temperature variations in order to counteract the affects of temperature on the receiver.

With respect to claim 6, Cowley discloses that the variations are caused by manufacturing tolerance variations of the bandpass filter (Column 3, lines 31-35).

With respect to claim 7, Cowley discloses coupling said first local oscillator signal to a local oscillator port of said first mixer when said RF input signal is disabled (Column 4, lines 13-20).

With respect to claim 8, since reference oscillator tone, element number 6, is produced from the same synthesizer, element number 9, which is the first local oscillator signal therefore it is interpreted as the first local oscillator signal is leaked through the mixer to the input port of the bandpass filter.

With respect to claim 9, Cowley discloses up-converting said selected channel in said first IF signal into said actual passband of said bandpass filter (Column 5, lines 40-55).

With respect to claims 10 and 14, Cowley does not expressly disclose that the passband of the filter is two channels wide. However, setting the widths of the bandpass filter is well known in the art. Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to set the width of the bandpass filter to two channels in Cowley's method in order to have a more precise bandpass filter thus increasing accuracy.

With respect to claim 11, Cowley discloses filtering said first IF signal so that only said selected channel passes through said bandpass filter (Column 4, lines 31-40).

With respect to claim 12, Cowley discloses mixing said selected channel at an output of said bandpass filter with a second local oscillator signal in said second mixer to down-converted said selected channel to baseband (Column 4, lines 41-48).

With respect to claim 15, Cowley discloses a receiver in figure 1 for processing an RF input signal having a plurality of channels (Column 2, lines 40-55). Cowley discloses a receiver input, element number 1, configured to receive an RF input signal having a plurality of channels (Column 3, lines 60-62). Cowley discloses a first mixer, element number 5, having a first input coupled to said receiver input and a second input coupled to a first local oscillator signal, element numbers 8 and 9 (Column 4, lines 21-27). Cowley discloses a bandpass filter, element number 10, having a passband and an input coupled to an IF output of said first mixer (Column 4, lines 28-29). Cowley discloses a second mixer, element number 11, having a first input coupled an output of the bandpass filter and a second input coupled to a second local oscillator signal, element numbers 13 and 14 (Column 4, lines 41-45). Cowley also discloses that the passband of said bandpass filter is determined by sweeping a frequency of said first local oscillator signal during a calibration mode (Column 2, lines 40-55). Cowley further discloses that no RF signal is received during the calibration mode (Column 4, lines 9-21 and Column 5, lines 24-27). Even though Cowley disables the RF input signal in calibration mode, a reference signal is still inputted to the mixer. However, Khorram discloses a calibration method of a receiver (Column 3, lines 44-46) thus making it analogous art since it is in the same field of endeavor. Khorram teaches in figure 17 disabling inputs to the mixer during calibration mode in step 1708 with only local

oscillator signal being injected into the mixer in step 1706 and enabling the input signal to the mixer after determining the optimum state in step 1714 (Column 13, lines 30-47). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to use Khorram's disabling of input signals to the mixer technique in Cowley's method in order to minimize local oscillator feedthrough while calibrating other parts of the system (abstract).

With respect to claim 16, Cowley discloses that after said calibration mode, said frequency of said first local oscillator is adjusted so that a selected channel of said plurality of channels falls in said passband of said bandpass filter that is determined during said calibration mode (Column 5, lines 40-54).

With respect to claim 17, Cowley discloses that after said calibration mode, said frequency of said first local oscillator signal is adjusted to account for any passband variation so that said selected channel of said plurality of selected channels is up-converted into said passband of bandpass filter (Column 5, lines 40-54).

With respect to claim 18, Cowley discloses a means, element number 18, for detecting a power output of said bandpass filter responsive to said first local oscillator during said calibration mode, said passband determined from said power output (Column 5, lines 40-54).

With respect to claim 19, Cowley discloses a local oscillator control module, element number 7, that receives said power output from said bandpass filter and determines said passband of said bandpass filter based on said power output, and

controls a frequency of said first local oscillator signal responsive to said passband of said bandpass filter (Column 5, lines 40-54).

With respect to claim 21, Cowley discloses that during said calibration mode, said local oscillator signal is swept over a frequency bandwidth sufficient to include said passband of said bandpass filter (Column 5, lines 40-54).

With respect to claim 22, Cowley discloses that during said calibration mode, said local oscillator signal is swept from a first frequency to a second frequency, said passband of said bandpass filter within a bandwidth defined by said first frequency and said second frequency (Column 5, lines 40-54).

With respect to claim 25 and 26, Cowley discloses the tuner on a common substrate with the bandpass filter disposed external to the common substrate (Column 3, lines 39-50).

5. Claims 13, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cowley (U.S. 6,954,625) and Khorram (U.S. 6,970,689) in view of Vorenkamp et al. (U.S. 6,591,091).

With respect to claim 13, the modified method of Cowley and Khorram is described above in the discussion of claims 1 and 9. Cowley does not expressly disclose providing image rejection. However, Vorenkamp et al. disclose a dual conversion tuner thereby making it analogous art since it is in the same field of endeavor. Vorenkamp et al. teach providing image rejection for selected channel

(Column 50, lines 3-7). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to apply Vorenkamp et al.'s image rejection technique in the modified method in order to suppress image frequencies thus making the system more reliable.

With respect to claims 23 and 24, the modified receiver of Cowley and Khorram is described above in the discussion of claim 15. Cowley does not expressly disclose using differential mode in the receiver. However, Vorenkamp et al. disclose a dual conversion tuner thereby making it analogous art since it is in the same field of endeavor. Vorenkamp et al. teach using differential mode having differential inputs and outputs as well as differential first and second mixers and bandpass filter in figure 48 (Abstract). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to apply Vorenkamp et al.'s differential mode technique in the modified receiver for better processing.

6. Claims 27-30, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cowley (U.S. 6,954,625) in view of Khorram (U.S. 6,970,689) further in view of Belotserkovsky (U.S. 6,678,012).

With respect to claim 27, Cowley discloses a receiver in figure 1 for processing an RF input signal having a plurality of channels (Column 2, lines 40-55). Cowley discloses a receiver input, element number 1, configured to receive an RF input signal having a plurality of channels (Column 3, lines 60-62). Cowley discloses a first mixer,

element number 5, having a first input coupled to said receiver input through element 5 and a second input coupled to a first local oscillator signal, element numbers 8 and 9 (Column 4, lines 21-27). Cowley discloses a bandpass filter, element number 10, having a passband and an input coupled to an IF output of said first mixer (Column 4, lines 28-29). Cowley discloses a second mixer, element number 11, having a first input coupled an output of the bandpass filter and a second input coupled to a second local oscillator signal, element numbers 13 and 14 (Column 4, lines 41-45). Cowley also discloses a LO control circuit, element number 7, that adjusts a frequency of said first local oscillator signal based on (1) a selected channel of said plurality of channels, and (2) a passband of said bandpass filter determined during a calibration mode (Column 5, lines 40-55). Cowley discloses a detector circuit, element number 18, that detects a signal level sends the information to the controller to control operations of the receiver (Column 5, lines 40-55). Cowley further discloses that no RF signal is received during the calibration mode (Column 4, lines 9-21 and Column 5, lines 24-27).

Even though Cowley disables the RF input signal in calibration mode, a reference signal is still inputted to the mixer. However, Khorram discloses a calibration method of a receiver (Column 3, lines 44-46) thus making it analogous art since it is in the same field of endeavor. Khorram teaches in figure 17 disabling inputs to the mixer during calibration mode in step 1708 with only local oscillator signal being injected into the mixer in step 1706 and enabling the input signal to the mixer after determining the optimum state in step 1714 (Column 13, lines 30-47). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to use Khorram's

disabling of input signals to the mixer technique in Cowley's method in order to minimize local oscillator feedthrough while calibrating other parts of the system (abstract).

Cowley does not disclose a programmable gain amplifier. However, Belotserkovsky a tuner thereby making it analogous art since it is in the same field of endeavor. Belotserkovsky discloses a programmable gain amplifier, element number 905, having an input coupled to an output of a bandpass filter, element number 903, and an output coupled to a second mixer, element number 909, with an AGC control line to control the gain of the PGA in figure 1 (Column 3, lines 46-50). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to apply Belotserkovsky's programmable amplifier technique in Cowley's receiver using Cowley's detector in order to provide a higher gain signal.

With respect to claim 28, Cowley further discloses that first local oscillator signal is swept during said calibration mode, and said detector circuit detects said signal level to said first local oscillator signal to determine said passband of said bandpass filter (Column 5, lines 40-54).

With respect to claim 29, Cowley further discloses that the LO control circuit adjusts said frequency of said first local oscillator signal so that said selected channel of said plurality of channels falls in said passband of said bandpass filter (Column 5, lines 40-54).

With respect to claim 30, neither Cowley nor Belotserkovsky disclose that the passband of the filter is two channels wide. However, setting the widths of the bandpass filter is well known in the art. Therefore, it would be obvious to one of

ordinary skill in the art at the time of the applicant's invention to set the width of the bandpass filter to two channels in the modified receiver in order to have a more precise bandpass filter thus increasing accuracy.

With respect to claim 32, Cowley discloses the tuner on a common substrate with the bandpass filter disposed external to the common substrate (Column 3, lines 39-50).

7. Claims 31 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cowley (U.S. 6,954,625), Khorram (U.S. 6,970,689) and Belotserkovsky (U.S. 6,678,012) further in view of Vorenkamp et al. (U.S. 6,591,091).

With respect to claim 31, the modified receiver is described above in the discussion of claim 27. None of the references disclose using differential mode in the receiver. However, Vorenkamp et al. disclose a dual conversion tuner thereby making it analogous art since it is in the same field of endeavor. Vorenkamp et al. teach using differential mode having differential inputs and outputs as well as differential first and second mixers and bandpass filter in figure 48 (Abstract). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to apply Vorenkamp et al.'s differential mode technique in the modified receiver for better processing.

With respect to claim 33, the modified receiver is described above in the discussion of claim 27. None of the references disclose providing image rejection.

However, Vorenkamp et al. disclose a dual conversion tuner thereby making it analogous art since it is in the same field of endeavor. Vorenkamp et al. teach that a second mixer of dual conversion mixer is an image rejection mixer in figure 48 (Column 50, lines 3-7). Therefore, it would be obvious to one of ordinary skill in the art at the time of the applicant's invention to apply Vorenkamp et al.'s image rejection technique in the modified receiver in order to suppress image frequencies thus making the system more reliable.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adeel Haroon whose telephone number is (571) 272-7405. The examiner can normally be reached on Monday thru Friday, 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung can be reached on (571) 272-7882. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AH
7/18/06

Nguyen Vo
7-19-2006

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PRIMARY EXAMINER